

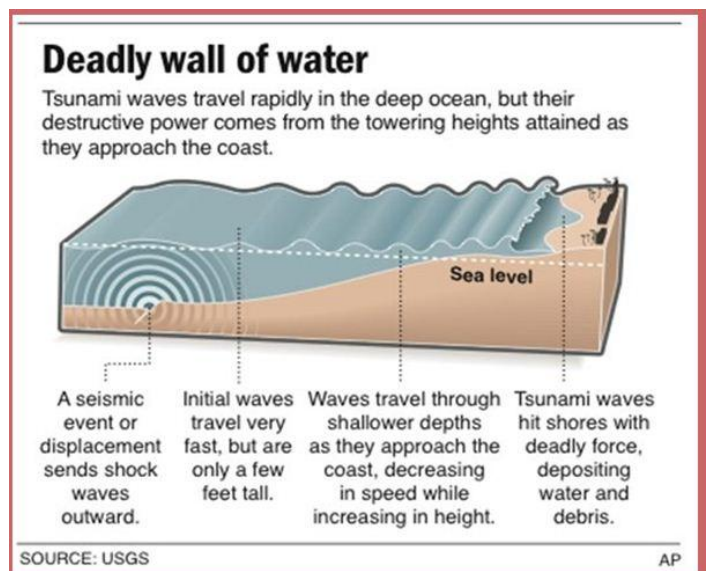


## TSUNAMI

Tsunamis (pronounced soo-ná-mees), are a series of large ocean waves generated by major earthquakes beneath the ocean floor or major landslides into the ocean.

From the area where the tsunami originates, waves travel outward in all directions. Once the wave approaches the shore, it builds in height. The topography of the coastline and the ocean floor will influence the size of the wave. There may be more than one wave and the succeeding one may be larger than the one before. That is why a small tsunami at one beach can be a giant wave a few miles away. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more.

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike. A tsunami can strike anywhere along most of the U.S. coastline. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska and Hawaii.



Earthquake-induced movement of the ocean floor most often generates tsunamis. If a major earthquake or landslide occurs close to shore, the first wave in a series could reach the beach in a few minutes, even before a warning is issued. The tsunami danger period can continue for many hours after a major earthquake. A tsunami can occur during any season of the year and at any time, day or night. Areas are at greater risk if they are less than 25 feet above sea level and within a mile of the shoreline. Tsunami waves and the receding water are very destructive to structures in the run-up zone. Other hazards include flooding, contamination of drinking water, and [fires](#) from gas lines or ruptured tanks. Drowning is the most common cause of death associated with a tsunami.

### 1. Know the Terms, Know the Signs of a Tsunami and Know How to Stay Informed

Familiarize yourself with these terms to help identify a tsunami hazard, the warning signs of a tsunami as well as where to get reliable local tsunami impact information.

- **Tsunami Warning**

A tsunami warning is issued when a tsunami with the potential to generate widespread inundation is imminent or expected. Warnings alert the public that dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after initial arrival. Warnings alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

- **Tsunami Advisory**

A tsunami advisory is issued when a tsunami with the potential to generate strong currents or waves dangerous to those in or very near the water is imminent or expected. The threat may continue for several hours after initial arrival, but significant inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

- **Tsunami Watch**

A tsunami watch is issued to alert emergency management officials and the public of an event which may later impact the watch area. The watch area may be upgraded to a warning or advisory - or canceled - based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

- **Tsunami Information Statement**

A tsunami information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a tsunami warning, watch or advisory has been issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive tsunami and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

- **Be Aware of the Signs of a Tsunami:**

There are only a few indicators our residents can use to identify a threat of a Tsunami.

- If you are on or near the coast and you experience a strong earthquake that lasts more than 20 seconds, these are the conditions that could produce a tsunami wave. You cannot see what is happening under the water however a large displacement could trigger a tsunami wave.
- If you are at the waterfront and there is noticeable recession in water away from the shoreline this is nature's tsunami warning and it should be heeded. You should



move away immediately.

- If you are on or near the coast and you hear a prolonged “roaring sound”, this is the sound of a large wave coming toward the shore. You should move away immediately.

- **Know How to Stay Informed**

Here are resources to provide you with reliable information regarding tsunami activities:

- **The International Tsunami Warning System** (ITWC) monitors ocean waves after any Pacific earthquake with a magnitude greater than 6.5. If waves are detected, warnings are issued to local authorities who can order the evacuation of low-lying areas if necessary.
- **The National Oceanic and Atmospheric Administration** (NOAA) National Weather Service operates two tsunami warning centers.
  - **West Coast/Alaska Tsunami Warning Center** (WC/ATWC), Palmer, Alaska. Serves Alaska, Washington, Oregon, California, the U.S. Atlantic and Gulf of Mexico coasts, Puerto Rico, the U.S. Virgin Islands and Canada.
  - **Pacific Tsunami Warning Center** (PTWC), Ewa Beach, Hawaii. Serves Hawaii and the U.S. Pacific territories, and as an international warning center for the Pacific and Indian oceans and the Caribbean Sea.
- Cal EMA website offers information on local hazards. Visit the Cal EMA website and look for the “My Hazards” section. Enter your zip code or address and then select what hazard you are researching.
- The City of Long Beach will use the following resources to share information with our community:
  - Long Beach Specific News on the Radio at KKJZ 88.1 FM
  - Greater Los Angeles News and Weather on the Radio at KNX 1070 AM, KFWB 980 AM, and KFI 640 AM
  - Long Beach Specific News on Television, Charter Channel 3 or Vios Channel 21
  - Greater Los Angeles News and Weather on Television, KCBS 2, KNBC 4, KABC 7, KCAL 9 , KTTV 11, and KCOP 13
  - Nixel
  - Reverse 911
  - Social Media – Facebook, Twitter, etc.

## **2. Be Prepared and Have a Plan**

The following are things you can do to protect yourself and your family from the effects of a tsunami:

- Find out if your home, school, workplace or other frequently visited locations are in tsunami hazard areas.
- Know your community's warning systems and disaster plans.
- Prepare [an emergency kit](#) and make a [family communications plan](#).
- Plan evacuation routes from your home, school, workplace and other places you could be where tsunamis present a risk. If possible, pick areas 100 feet above sea level or go as far as 2 miles inland, away from the coastline. If you cannot get this high or far, go as high or far as you can. Every foot inland or upward may make a difference. You should be able to reach your safe location on foot within 15 minutes.
- Find out what the school evacuation plan is. Find out if the plan requires you to pick your children up from school or from another location. Telephone lines during a tsunami watch or warning may be over loaded and routes to and from schools may be jammed.
- Practice your evacuation routes. Familiarity may save your life. Be able to follow your escape route at night and during inclement weather. Practicing your plan makes the appropriate response more of a

reaction, requiring less thinking during an actual emergency. Keep in mind that public safety officials may direct you to a different evacuate route. Follow their direction.

### **3. What To Do During a Tsunami Watch**

- Use a NOAA Weather Radio or tune to a Coast Guard emergency frequency station or a local radio or television station for updated emergency information.
- Locate household members and review evacuation plans. Be ready to move quickly if a tsunami warning is issued.

### **4. What To Do During a Tsunami Warning**

- If you hear an official tsunami warning or detect signs of a tsunami, evacuate at once.
- Take your emergency preparedness kit. Having supplies will make you more comfortable during the evacuation.
- Take your pets with you. If it is not safe for you, it's not safe for them.
- Get to higher ground as far inland as possible. Watching a tsunami could put you in grave danger. If you can see the wave, you are too close to escape it.

### **5. What To Do During a Tsunami**

- If you are in a coastal area and feel an earthquake that lasts 20 seconds or longer:
  - Drop, cover and hold on. You should first protect yourself from the earthquake.
  - Turn on your radio to learn if there is a tsunami warning.
  - When the shaking stops, gather members of your household and move quickly to higher ground away from the coast. A tsunami may be coming within minutes.
  - Avoid downed power lines and stay away from buildings and bridges from which heavy objects might fall during an aftershock.
- If you are in a coastal area:
  - Follow the evacuation order issued by authorities and evacuate immediately. Take your animals with you.
  - Move inland to higher ground immediately. Go as high or far as you can, every foot inland or upward may make a difference.
  - Stay away from the beach. Never go down to the beach to watch a tsunami come in. If you can see the wave you are too close to escape it.
  - Save yourself - not your possessions.
  - Remember to help your neighbors who may require special assistance - infants, elderly people, and individuals with access or functional needs.

### **6. What To Do After a Tsunami**

- Check yourself for injuries and get first aid as needed before helping injured or trapped persons.
- If someone needs to be rescued, call professionals with the right equipment to help. Many people have been killed or injured trying to rescue others.
- Help people who require special assistance—infants, elderly people, those without transportation, people with access and functional needs and large families who may need additional help in an emergency situation.
- Watch animals closely and keep them under your direct control.
- Use the telephone only for emergency calls.
- Continue using a NOAA Weather Radio or tuning to a Coast Guard station or a local radio or television station for the latest updates.
- Stay away from debris in the water; it may pose a safety hazard to people or pets.

- Stay out of any building that has water around it. Tsunami water can cause floors to crack or walls to collapse.
- Use caution when re-entering buildings or homes. Tsunami-driven floodwater may have damaged buildings where you least expect it. Carefully watch every step you take.
- If you left the area, return home only after local officials tell you it is safe. A tsunami is a series of waves that may continue for hours. Do not assume that after one wave the danger is over. The next wave may be larger than the first one.
- Go to a designated public shelter if you have been told to evacuate or you feel it is unsafe to remain in your home.
- Avoid disaster areas. Your presence might interfere with emergency response operations and put you at further risk from the residual effects of [floods](#).
- To avoid injury, wear protective clothing and be cautious when cleaning up.
- **Let Your Family Know That You Are Safe**

#### City of Long Beach:

Disaster Preparedness:

<http://www.longbeach.gov/disasterpreparedness>

Police Department

<http://www.longbeach.gov/police/default.asp>

Health and Human Services

<http://www.longbeach.gov/civica/filebank/blobdload.asp?BlobID=9067>

#### County Agency:

Los Angeles County Office of Emergency Management

<http://www.lacoa.org/>

#### State Agency:

The Governor's Office of Emergency Services

<http://www.oes.ca.gov/>

#### Federal Agency:

Department of Homeland Security

<http://www.dhs.gov/index.shtm>

U.S. Geological Survey – Specific earthquake information and maps.

<http://www.usgs.gov/>

Center for Disease Control and Prevention

<http://www.cdc.gov/> or <http://www.bt.cdc.gov/planning/index.asp>

#### City of Long Beach Emergency Phone Numbers:

##### **Emergencies Dial 911**

- **Gas Department:** 562.570.2140
- **Water and Sewer:** 562.570.2390
- **Public Works:** 562.570.2700
- **Police Non-Emergency** 562.435.6711
- **Fire Non-Emergency** 562.570.9400

#### Social Media:

You can also sign up for any of the City of Long Beach social media accounts and receive updates on the City's

disaster responses, as well as information to assist you.

[www.facebook.com/CityofLongBeachCA](http://www.facebook.com/CityofLongBeachCA)

<https://twitter.com/LongBeachCity>

[www.youtube.com/user/LongBeachCityCA](http://www.youtube.com/user/LongBeachCityCA)

